1:30 tossing with pain in his head. He was sent at once to the hospital and instructions given to prepare him for the operating room immediately. At 1:30 p. m., Dr. Ryan accompanying me, I again cleaned out the left mastoid carefully and the exposed dura, when cleaned of the granulations, seemed firmly adherent and of a healthy color. We could see no indication for further exploration, so decided to await development. Temperature was 102.2° on entering the operating room, and in the evening had dropped to 100.7°. Pulse 80.

September 17. Temperature 103 in the morning. No sign of chill. No pain in region of ears, but head throbbing. Tongue heavily coated and foetid breath. Bowels tympanitic.

The question now, as is usual in these cases, was: Has he meningitis or is he developing typhoid? I called for a Widal test and called Dr. Bakewell to examine him. Patient slept a great deal all day and in the evening felt much better.

September 18. Report from Widal negative. Patient at times restless, but did not complain of pain. No appetite. Temperature range 99.6° to 103.6°. Slept nearly all night. Left mastoid was dressed that morning and was doing nicely.

September 19. At 10 a. m. had chill, after which the temperature arose to 102.3°. Complained of pain in back and back of neck. Muttering delirium. Toward evening brightened up and felt better. Was very restless all that night until quieted by ¼ morphia.

September 20. Still very restless. Dr. Campbell was called in and asked to do a spinal puncture, at which time he drew about 25 c.c. of turgid fluid under pressure. This relieved the patient markedly. On consultation with Drs. Campbell and Bakewell that afternoon it was decided to open the base of skull for drainage. At 7:30 p. m. the wound was reopened and an entrance was made through the tegmen into the middle fossa, making a free opening. Instead of a free drainage we came in contact with a coagulum, quite a quantity of which was removed and a drainage tube inserted. Patient became restless again about midnight. Drainage next morning was slight. Patient gradually failed and at noon that day passed away.

Laboratory reports:

Smear from mastoids—Two cocci found.
Smear from culture—No growth.
Blood on first entrance:
Leukocytes, 7200;
Hemoglobin, 90%;
Polymor., 76%;
Lymphocytes, 23;
Monoauclear, 1%.
September 19—Same.
September 21—Leukocytes, 36200.
Culture from spinal fluid: Smear shows many diplococci, both gram negative and positive resembling meningococcus.

The apparent complete recovery after the initial operation made us hesitate to enter the cranium. We also feel that had drainage been established at once on his return the results might have been different.

THE POSSIBLE RELATIONSHIP OF DENTAL ABSCESSES AND THE TOXEMIAS OF PREGNANCY.*

By FREDERIC M. LOOMIS, M. D., Oakland, Cal.

I am aware of the saying of Abe Martin, recently quoted in the Journal of the American Medical Association, that the old-time doctor who always wanted to tap someone had been succeeded by a full grown son who wanted to pull everybody's teeth.

I know that dental abscesses have been held responsible for many undeserved evils; that there has been an epidemic of ill-advised extraction; and that the pendulum has commenced to swing the other way. But I know, too, and we all know, that there are daily recoveries from long standing disabilities following the deliberately considered extraction of abscessed teeth. However, with the exception of brief references in passing, notably in Edgar's Text and two papers by Mosher, I had been unable to find any direct discussion of the possible relationship of chronic dental sepsis and the toxemias of pregnancy until the important contribution by Talbot in Surgery, Gynecology and Obstetrics for February of this year.

Eclampsia remains the "disease of theories" and this paper does not attempt a solution. It does seriously advance a possible reason why of two apparently normal women, one develops a serious toxemia and one goes free; that is, why one breaks down under the normal overload of pregnancy, and the other does not; or, more exactly, why one possesses such a slender margin of eliminating or de-toxifying reserve that the added burden of pregnancy overcomes her.

All pregnant women bear a theoretically equal burden of elimination, except perhaps those who have twins, and in these the proportion of eclampsia is three times the normal rate. It has repeatedly been noticed that the woman who has an early toxemia, the type of vomiting which is not easily relieved, is likely to have the evidences of toxemia later. I have never yet heard an adequate explanation of post partum eclampsia and unless some outside factor, other than maternal or fetal metabolism be considered, these facts are now too hard to explain. DeLee himself in the Year Book for 1918 says he has "always held the suspicion that an infection will finally be found at the bottom of eclampsia." We know now that no infection is a wholly localized process but that from it are absorbed a greater or less number of toxins. These toxins must be destroyed or eliminated, and the liver, the kidneys and perhaps the thyroid are of course the chief agents. We know too that successful uncomplicated pregnancy is almost synonymous with successful elimina-

* Read before the Forty-eighth Annual Meeting of the Medical Society, State of California, Santa Barbara, April, 1919.

tion. We do not cure eclampsia when we use the so-called Rotunda and Stroganoff treatments, but we so depress the nervous threshold that our patients are not racked by convulsions (which in turn produce more toxins) during the few hours preceding delivery, and at the same time we stimulate elimination. We do not cure eclampsia by delivery alone, but we try to reduce the overload before the renal and cortical edema has become so great that our patient dies from the retention of the substances, whatever they may be, that should have been eliminated.

Is it not reasonable to assume that the irritation of chronic sepsis may be one of the determining factors in lowering the ability of the liver and the kidney to carry their load? Unquestionably the elimination of the products of acute infection is injurious to the liver and to the renal structures, and the steady damage of years of elimination of the toxins of chronic sepsis must leave its mark. Talbot says, "it is a fundamental characteristic of all things in this world to wear out."

How frequent is dental abscess and what are the probabilities of absorption? At my request Dr. Walter R. Hughes of Oakland examined the films of 125 devitalized teeth, with root canals filled, and found 103 abscesses clearly apparent. Dental authorities state that from 50 to 85% of all devitalized teeth are infected, and repeated animal inoculation experiments have shown, by the production of lesions of almost every variety, notably of the heart, the joints and the kidneys, that these abscesses contain active organisms. There are many who believe that there is a constant entry of living organisms as well as of their products into the blood stream. "They are carried into the blood by passive entrance through the capillary walls, by growth through the walls of the vessels, by the leucocytes, and by the lymph channels. The deeper the infection is seated in the tissue and the greater the pressure of the accumulated bacterial products, the larger is the amount of absorption. Mucous membrane absorbs easily. An abscess enclosed by bone gives no chance for infiltration or extension; therefore the pressure is great and the bacterial products are absorbed readily." (Billings.) The possibilities for absorption in pyorrhea are evident when it is remembered that the average denture has a circumference of about 30 inches at the gum line. If the patient has pyorrhea with a line of only an eighth of an inch involved, there results an area of 3¾ square inches of infected tissue, where most active absorption can occur.

How about direct evidence? My attention to the question of dental sepsis in pregnancy was dramatically aroused by the following case:

I. Primipara of 27, 7th week. In bed, restless, nervous, constantly nauseated. Immediate improvement on injection of corpus luteum and regulation of diet. Improvement lasted only a week and thereafter for 6 weeks every kind of treatment was a failure. Repeated examinations eliminated every probable cause of nausea. The uterus was forward in good position. The patient was able to command every attention money could buy and finally under skillful nursing improved, but was always toxic and spent about half her time in bed. As she approached the eighth month, the systolic pressure gradually increased to 156, she became edematous and I was only awaiting the appearance of albumen or a further rise of pressure to interrupt pregnancy. One night, by the grace of Providence, one of her apparently perfect and beautifully cared for teeth commenced to ache. Pain increased till 36 hours later when a dentist was called at night, extracted the tooth under local anesthesia, and a quantity of foul material was liberated. In eight hours her blood pressure dropped 30 points, her edema subsided and she went on to term with a normal delivery.

Among other instances, the following are submitted as suggestive.

II. Seen in consultation with Dr. Dudley Smith.

About a year ago went through a pregnancy spent mostly in bed under excellent care. Severe asthma, nausea, intense intercostal pain, headache, edema and finally premature rupture of the membranes and loss of the child. No laboratory or clinical evidence of lues, and all other examinations practically negative.

In January, 1918, missed one period and again suffered so intensely with intercostal pain and nausea that relief was imperative. In the absence of her physician it was insisted that her teeth be X-rayed. The teeth had been examined every few months for years by a competent dentist who hooted at a possible abscess. Nevertheless the abscess was found, the tooth was extracted with two attached abscesses and both the pain and nausea stopped within 12 hours. No examination for pregnancy had been made and the patient proved not to be pregnant, but had simply been toxic and from then on has made a continued improvement. Suspicious tonsils were also removed and I believe it a reasonable supposition that her next pregnancy will be different.

III. Hyperemesis; seen in consultation with Dr. Ergo Majors; constant emesis of everything, including water; in hospital. Six large gold crowns. X-rays show four enormous abscesses. Incomplete report as extraction not yet done.

IV. Patient of Dr. Majors: Primipara, 4½ months. Very severe headache lasting for 3 weeks, with constant nausea. Blood pressure gradually increased to 145, with heavy trace of albumen. Five abscesses found, with unbelievably rapid recovery from all symptoms, including albuminuria, within 12 hours after removal. No recurrence. At no time had toothache or other local symptoms.

V. Hydramnios; IV-para, constantly toxic, condition finally requiring rupture of membranes. Four abscesses found, but report not yet complete.

VI. Primipara with no symptoms, no clinical or laboratory evidence of lues or nephritis, but gradually increasing blood pressure to 165. No albumen, edema or other evidence of toxemia. Labor at term, after cessation of all movement, with still-born child. Mouth a mass of pyorrhea alveolaris; blood pressure remains constantly high 3 months after delivery, while pyorrhea and abscesses are treated.

VII. II-para. Eclampsia and loss of child at term. Never any mouth symptoms but a very large abscess removed during the fourth month of this pregnancy. Now looks and feels better than ever, and is apparently perfectly normal at the 6th month.

VIII. II-para. Hyperemesis. Corpus luteum by hypo and all other treatment ineffective in overcoming nausea which continued till an abscess was opened and drained at the 5th month, when there was prompt improvement.

I am now investigating the cases of hyperemesis, preeclamptic toxemia and eclampsia on my books and so far have not found one without definite dental trouble except one case of pernicious vomiting seen in consultation with Dr. Clarence Page, where X-rays were negative. Dr. Edith Brownsill of Berkeley has kindly investigated 6 of her cases and 5 of the six have definite evidence of dental sepsis. Dr. Anderson, neurologist, of Oakland, reports to me two carefully worked out cases of post-partum insanity, relieved by the removal of abscesses, recovery occurring almost over night; plain cases of toxic psychoses wherein not the strain of pregnancy but the strain of chronic sepsis was the fundamental cause, the pregnancy being the minor factor.

So much for evidence—not all conclusive but so highly suggestive that I think we must pay attention to it. I have reached the point where every new patient of mine who has any devitalized teeth must have an X-ray of them or get another doctor. And to my surprise, I am finding not opposition, but co-operation. In fact I find that many dentists are in as great need of education as are the patients, and are less willing to learn. I have learned that the dentist who advises against X-rays because he knows "those teeth are all right" is unsafe and wrong. No one knows that a devitalized tooth is right in the absence of proof, and we are learning that the presumption is the other way. The best men in dentistry are frankly troubled and distressed about their future. They are as reluctant to extract apparently sound teeth as are their patients to have them, but there is growing the conviction that treatment (filling root canals to save or crown a tooth) is not only futile but a menace.

In the presence of definite abscesses I have advised extraction in every month of pregnancy up to the 9th under local or general anesthesia and have not yet had an acute increase of symptoms nor a threatened termination of pregnancy. I think the occasional reports of trouble are due to vigorous curettings, which of course make trouble and should be avoided. If I am asked, as I always am, if there is any danger in having this tooth out now, I think I am now justified in saying (with an undoubted abscess present) that there is less danger in having it out than having it in.

I am not carried away with my subject. I do not believe that a dental abscess is necessarily the cause of a toxemia just because it is present. I do not know how many patients who go through perfectly normal pregnancies have mouth infections but the number must be large. I do know that so far I have found but one toxic patient (Dr. Page's) who did not have one or more infections, and Talbot of Massachusetts reports than in 97 consecutive cases of toxemia, every one without exception showed chronic dental sepsis.

We have for years told our patients to keep their teeth clean during pregnancy, and to be examined by their dentists—that is to keep the tops of their teeth cleaned, to avoid caries. And now, until I am otherwise persuaded, I believe we must go further and see that the hidden dangers at the other ends of the teeth are brought to light.

PATHOLOGIC INDICATIONS FOR CHOLECYSTECTOMY.*

By ANDREW STEWART LOBINGIER, M. D., F. A. C. S., Los Angeles.

A singular divergence of opinion amongst surgeons of large experience continues to appear on the indications for cholecystectomy. If one were to venture to find a reason for this confusion it would probably be seen in a too broad generalization concerning the pathology justifying the removal of the gall bladder. For instance, one authority advises a cholecystectomy in every case of inflammation because the patient makes a more prompt and uncomplicated recovery.

Another, though formerly prejudiced in favor of cholecystostomy, now prefers cholecystectomy and would make the one exception that of pancreatitis.

Still another recommends cholecystectomy in all cases unless the patient's condition is bad.

Whilst another authority, claiming an experience of 2000 cases of disease of the gall bladder and ducts, believes cholecystectomy to be the operation of choice.

These illustrations of settled opinion without a basis of pathology to justify it might be multiplied indefinitely; but the ingenious reasoning of one authority strikes us as most unique: He determines the presence of free HCl in the stomach: if it is absent he removes the gall bladder; if it is present he does a cholecystostomy.

It is obvious that these views do not represent the judgment of most of the ablest authorities on this subject; but one is astonished in reviewing the opinions of some of them, to find how loose and indefinite is their statement of the indications for cholecystectomy. Because of this indefiniteness, and because very serious results may follow the removal

*Read before the Forty-eighth Annual Meeting of the Medical Society, State of California, Santa Barbara, April, 1919.